

AF/1763
JF



FEE TRANSMITTAL FOR FY 2008

(Effective on 9/30/2007. Fees pursuant to the Consolidated Appropriations Act, 2005 (H.R. 4818).

TOTAL AMOUNT OF PAYMENT (\$) \$510.00

Complete if known:

Application No. 09/828,067
Filing Date April 6, 2001
First Named Inventor Don Curry et al.
Examiner Name Zervigon, Rudy
Art Unit 1763
Attorney Docket No. 005040/TCG/PMD/HMM

Applicant claims small entity status. See 37 CFR 1.27.

METHOD OF PAYMENT (check all that apply)

☒ Check ☐ Credit Card ☐ Money Order ☐ None ☐ Other (please identify)

Deposit Account

Deposit Account Number : 02-2666

Deposit Account Name: _____

☒ The Director is Authorized to do the following with respect to the above-identified Deposit Account:

- ☒ Charge fee(s) indicated below.
- ☒ Charge any additional fee(s) or underpayment of fee(s) during the pendency of this application.
- ☐ Charge fee(s) indicated below except for the filing fee
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FEE CALCULATION

1. BASIC FILING, SEARCH, AND EXAMINATION FEES

| Large Entity | | Small Entity | | Fee Description | | Fees Paid (\$) |
|--------------|----------|--------------|----------|------------------------------------|-----------|----------------|
| Fee Code | Fee (\$) | Fee Code | Fee (\$) | | | |
| 1011 | 310 | 2011 | 155 | Utility application filing fee | 1,030/515 | |
| 1111 | 510 | 2111 | 255 | Utility search fee | | |
| 1311 | 210 | 2311 | 105 | Utility examination fee | | |
| 1012 | 210 | 2012 | 105 | Design application filing fee | 440/220 | |
| 1112 | 100 | 2112 | 50 | Design search fee | | |
| 1312 | 130 | 2312 | 65 | Design examination fee | | |
| 1013 | 210 | 2013 | 105 | Plant filing fee | 680/340 | |
| 1113 | 310 | 2113 | 155 | Plant search fee | | |
| 1313 | 160 | 2313 | 80 | Plant examination fee | | |
| 1004 | 810 | 2004 | 405 | Reissue filing fee | 1,940/970 | |
| 1114 | 510 | 2114 | 255 | Reissue search fee | | |
| 1314 | 620 | 2314 | 310 | Reissue examination fee | | |
| 1005 | 210 | 2005 | 105 | Provisional application filing fee | | |
| SUBTOTAL (1) | | | | | | \$ <u>0.00</u> |

2. EXCESS CLAIM FEES**Fee Description**

| Large Entity | | Small Entity | | |
|---------------------|----------|---------------------|----------|--|
| Fee Code | Fee (\$) | Fee Code | Fee (\$) | Fee Description |
| 1202 | 50 | 2202 | 25 | Each claim over 20 |
| 1201 | 210 | 2201 | 105 | Each independent claim over 3 |
| 1203 | 370 | 2203 | 185 | Multiple dependent claims, if not paid |
| 1204 | 210 | 2204 | 105 | Reissue: each claim over 20 and more than in the original patent |
| 1205 | 50 | 2205 | 25 | Reissue: each independent claim more than in the original patent |

| | Extra Claims | Fee | Fees Paid (\$) |
|---|---------------------|---------------------|-----------------------|
| Total Claims _____ - 20 or HP = _____ | | X \$50.00 = _____ | |
| HP = highest number of total claims paid for, if greater than 20 | | | |
| Independent Claims _____ - 3 or HP = _____ | | X \$210.00 = _____ | |
| HP = highest number of independent claims paid for, if greater than 3 | | | |
| Multiple Dependent Claims _____ | | _____ = _____ | |
| | | SUBTOTAL (2) | \$ 0.00 |

3. APPLICATION SIZE FEE

If the specification and drawings exceed 100 sheets of paper (excluding electronically filed sequence or computer listings under 37 C.F.R. 1.52(e)), the application size fee due is \$250 (\$125 for small entity) for each additional 50 sheets or fraction thereof. See 35 U.S.C. 41(a)(1)(G) and 37 CFR 1.16(s).

| Total Sheets | Extra Sheets | Number of each additional 50 or fraction thereof | Fee from below | Fees paid (\$) |
|---------------------|---------------------|---|-----------------------|-----------------------|
| _____ - 100 = _____ | _____ / 50 = _____ | (round up to whole number) | X \$ _____ | _____ |

| Large Entity | | Small Entity | | |
|---------------------|----------|---------------------|----------|-----------------|
| Fee Code | Fee (\$) | Fee Code | Fee (\$) | Fee Description |
| 1081 | 260 | 2081 | 130 | Utility |
| 1082 | 260 | 2082 | 130 | Design |
| 1083 | 260 | 2083 | 130 | Plant |
| 1084 | 260 | 2084 | 130 | Reissue |

SUBTOTAL (3) \$ 0.00

FEE CALCULATION (continued)**4. OTHER FEE(S)**

| | | | | Fees Paid (\$) | |
|---|----------|---------------------|----------|--|------------------|
| Non-English Specification, \$130 fee (no small entity discount) | | | | | |
| <u>Large Entity</u> | | <u>Small Entity</u> | | | |
| Fee Code | Fee (\$) | Fee Code | Fee (\$) | Fee Description | |
| 1051 | 130 | 2051 | 65 | Surcharge - late filing fee or oath | |
| 1052 | 50 | 2052 | 25 | Surcharge - late provisional filing fee or cover sheet | |
| 1053 | 130 | 1053 | 130 | Non-English specification | |
| 1812 | 2,520 | 1812 | 2,520 | For filing a request for ex parte reexamination | |
| 1813 | 8,800 | 1813 | 8,800 | Request for inter parties reexamination | |
| 1804 | 920* | 1804 | 920* | Requesting publication of SIR prior to Examiner action | |
| 1805 | 1,840* | 1805 | 1,840* | Requesting publication of SIR after Examiner action | |
| 1251 | 120 | 2251 | 60 | Extension for reply within first month | |
| 1252 | 460 | 2252 | 230 | Extension for reply within second month | |
| 1253 | 1,050 | 2253 | 525 | Extension for reply within third month | |
| 1254 | 1,640 | 2254 | 820 | Extension for reply within fourth month | |
| 1255 | 2,230 | 2255 | 1,115 | Extension for reply within fifth month | |
| 1401 | 510 | 2401 | 255 | Notice of Appeal | |
| 1402 | 510 | 2402 | 255 | Filing a brief in support of an appeal | \$510.00 |
| 1403 | 1,030 | 2403 | 515 | Request for oral hearing | |
| 1451 | 1,510 | 1451 | 1,510 | Petition to institute a public use proceeding | |
| 1452 | 510 | 2452 | 255 | Petition to revive - unavoidable | |
| 1453 | 1,540 | 2453 | 770 | Petition to revive - unintentional | |
| 1501 | 1,440 | 2501 | 720 | Utility issue fee (or reissue) | |
| 1502 | 820 | 2502 | 410 | Design issue fee | |
| 1503 | 1,130 | 2503 | 565 | Plant issue fee | |
| 1462 | 400 | 1462 | 400 | Petitions to the Commissioner (CFR 1.17(f) Group I) | |
| 1463 | 200 | 1463 | 200 | Petitions to the Commissioner (CFR 1.17(g) Group II) | |
| 1464 | 130 | 1464 | 130 | Petitions to the Commissioner (CFR 1.17(h) Group III) | |
| 1807 | 50 | 1807 | 50 | Processing fee under 37 CFR 1.17(q) | |
| 1806 | 180 | 1806 | 180 | Submission of Information Disclosure Stmt | |
| 8021 | 40 | 8021 | 40 | Recording each patent assignment per property (times number of properties) | |
| 1809 | 810 | 2809 | 405 | For filing a submission after final rejection (see 37 CFR 1.129(a)) | |
| 1814 | 130 | 2814 | 65 | Statutory Disclaimer | |
| 1810 | 810 | 2810 | 405 | For each additional invention to be examined (see 37 CFR 1.129(b)) | |
| 1801 | 810 | 2801 | 405 | Request for Continued Examination (RCE) | |
| 1802 | 900 | 1802 | 900 | Request for expedited examination of a design application | |
| 1504 | 300 | 1504 | 300 | Publication fee for early, voluntary, or normal pub. | |
| 1505 | 300 | 1505 | 300 | Publication fee for republication | |
| 1803 | 130 | 1803 | 130 | Request for voluntary publication or republication | |
| 1808 | 130 | 1808 | 130 | Processing fee under 37 CFR 1.17(i) (except provisionals) | |
| 1454 | 1,410 | 1454 | 1,410 | Acceptance of unintentionally delayed claim for priority | |
| Other fee (specify) _____ | | | | | |
| Other fee (specify) _____ | | | | | |
| | | | | SUBTOTAL (4) | \$ 510.00 |

*Reduced by Basic Filing Fee Paid

SUBMITTED BY:Typed or Printed Name: Michael A. BernadicouSignature:  Date: October 10, 2007Reg. Number: 35,934Telephone Number: 408-720-8300

Send to: Commissioner for Patents, P.O. Box 1450, Alexandria, VA 22313-1450

**AMENDMENT TRANSMITTAL****PATENT**

Application No.: 09/828,067
Filing Date: April 6, 2001
First Named Inventor: Don Curry et al.
Examiner's Name: Zervigon, Rudy
Art Unit: 1763
Attorney Docket No.: 005040/TCG/PMD/HMM

- ☐ An Amendment After Final Action (37 CFR 1.116) is attached and applicant(s) request expedited action.
- ☒ Charge any fee not covered by any check submitted to Deposit Account No. 02-2666.
- ☒ Applicant(s) hereby request and authorize the U.S. Patent and Trademark Office to (1) treat any concurrent or future reply that requires a petition for extension of time as incorporating a petition for extension of time for the appropriate length of time and (2) charge all required fees, including extension of time fees and fees under 37 CFR 1.16 and 1.17, for any concurrent or future reply to Deposit Account No. 02-2666.
- ☐ Applicant(s) claim small entity status (37 CFR 1.27).

ATTACHMENTS

- ☐ Preliminary Amendment
- ☐ Amendment/Response with respect to Office Action
- ☐ Amendment/Response After Final Action (37 CFR 1.116) (reminder: consider filing a Notice of Appeal)
- ☒ Appeal Brief Under 37 C.F.R. 41.37(a)
- ☐ RCE (Request for Continued Examination)
- ☐ Supplemental Declaration
- ☐ Terminal Disclaimer (reminder: if executed by an attorney, the attorney must be properly of record)
- ☐ Information Disclosure Statement (IDS)
- ☐ Copies of IDS citations
- ☐ Petition for Extension of Time
- ☐ Fee Transmittal Document (that includes a fee calculation based on the type and number of claims)
- ☐ Cross-Reference to Related Application(s)
- ☐ Certified Copy of Priority Document
- ☐ Other: _____
- ☐ Other: _____
- ☒ Check(s)
- ☒ Postcard (Return Receipt)

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CERTIFICATE OF MAILING BY FIRST CLASS MAIL (if applicable)

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Date of Deposit

Teresa Mattox

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Atty. Docket No.: 005040/TCG/PMD/LE
(BSTZ Ref. No.: 004887.P522)

PATENT



**IN THE UNITED STATES PATENT AND TRADEMARK OFFICE
BEFORE THE BOARD OF PATENT APPEALS AND INTERFERENCES**

In Re Application of:

Don Curry et al.

Application No.: 09/828,067

Filed: April 6, 2001

For: WAFER PROCESSING
APPARATUS HAVING A CHAMBER WITH
AN UPPER WALL HAVING GAS SUPPLY
OPENINGS FORMED THEREIN WHICH
PROMOTE MORE EVEN PROCESING OF
A WAFER

Examiner: Zervigon, Rudy

Art Unit: 1763

Confirmation No: 7268

Mail Stop Appeal Brief-Patents
Commissioner for Patents
P.O. Box 1450
Alexandria, Virginia 22313-1450

APPEAL BRIEF UNDER 37 C.F.R. § 41.37(a)

This is an appeal to the Board of Patent Appeals and Interferences from the decision of the Examiner of Group 1763, dated May 14, 2007, which finally rejected Claims 29-35 and 38-57 in the above-identified application. The Offices date of receipt of Appellant's Notice of Appeal was August 15, 2007. This Appeal Brief is hereby submitted pursuant to 37 C.F.R. § 41.37(a).

FIRST CLASS CERTIFICATE OF MAILING

I hereby certify that this correspondence is being deposited with the United States Postal Service as first class mail with sufficient postage in an envelope addressed to the Commissioner for Patents, P.O. Box 1450, Alexandria, VA 22313-1450 on October 10, 2007

Date of Deposit

Teresa Mattox

Name of Person Mailing Correspondence 01 FC:1462

October 10, 2007

Signature

Date

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I. REAL PARTY IN INTEREST

The real party in interest and assignee of record is Applied Materials, Inc., a corporation of Delaware having a principle place of business at 3050 Bowers Avenue, Santa Clara, California 95054.

II. RELATED APPEALS AND INTERFERENCES

To the best of Appellant's knowledge, there are no appeals or interferences related to the present appeal that will directly affect, be directly affected by, or have a bearing on the Board's decision in the instant appeal.

III. STATUS OF THE CLAIMS

Claims 29-35 and 38-57 are pending in the present application.

Claims 1-28 and 36-37 have been canceled.

Claims 29-35 and 38-57 have been finally rejected under 35 U.S.C. 103(a) in an Office Action mailed May 14, 2007.

Claims 29, 40, 42, and 47 are the subject of this appeal. A copy of Claims 29, 40, 42, and 47 as they stand on appeal are set forth in Appendix A.

IV. STATUS OF AMENDMENTS

No amendments have been submitted subsequent to the Final Office Action mailed May 14, 2007.

V. SUMMARY OF CLAIMED SUBJECT MATTER

This section of this Appeal Brief is set forth to comply with the requirements of 37 C.F.R. 41.37(c)(1)(v) and is not intended to limit the scope of the claims in any way. Exemplary implementations of the limitations of independent claims 29, 42, and 47, and dependent claim 40 are described below.

Appellant's invention, as claimed in claims 29-35 and 38-57, is directed to an apparatus for processing wafers, such as those used in the semiconductor industry, paragraph [0002].

Independent claims 29, 42, and 47 relate to a wafer processing apparatus 10, as illustrated in FIG. 10, comprising a processing chamber 12, a manifold cavity 60, processing gas supply line 20, and an exhaust line 122. The processing gas supply line 20 is connected to the manifold cavity 60 for providing a processing gas comprising reactive gases into the manifold cavity 60. Exhaust line 122 is connected to the processing chamber 12 for flowing an exhaust gas from the processing chamber 12. The particular configuration of the wafer processing apparatus creates a flow pattern of the processing gas over a wafer 274 and toward the exhaust line 122 that promotes even processing over the upper surface of the wafer.

The processing chamber 12 is partially defined by an upper wall 232. Additionally, a susceptor 14 is in the processing chamber 12, and a wafer supply opening 40 is formed in one of the chamber walls for transferring a wafer into the chamber 12 and on the susceptor 14 (see FIG. 8). The manifold cavity 60 is

located on the processing chamber 12 and is partly defined by the upper surface of the upper wall 232 of the processing chamber 12.

The upper wall 232 of the processing chamber 12 comprises a plurality of processing gas supply openings 242 which provide a pathway for flowing the processing gas from the manifold cavity 60 and into the processing chamber 12. The processing gas supply openings 242 are non-uniformly distributed over the upper wall 232.

In independent claim 29, the processing gas comprises reactive gases, and the non-uniformly distributed processing gas supply openings 242 create a predominantly vertical flow of processing gas onto the wafer 274.

In independent claim 42, the processing gas comprises non-depleted reactive gases, and the flow pattern of processing gas onto the upper surface of the wafer 274 is predominantly determined by the non-uniformly distributed processing gas supply openings 242, manifold cavity 60 and component 18, processing gas supply 20, and exhaust system comprising an exhaust line 122.

In independent claim 47, the processing gas comprises reactive gases, the processing gas supply openings 242 are non-uniformly distributed, and the exhaust gas comprises reacted gases and depleted processing gas.

In dependent claim 40, the processing gas in the manifold cavity 60 comprises non-depleted reactive gases used for processing the wafer 274. While in independent claim 47, the exhaust gas comprises reacted gases and depleted processing gas.

VI. GROUNDS OF REJECTIONS TO BE REVIEWED ON APPEAL

A. Whether claims 29, 42, and 47 are unpatentable under 35 U.S.C. 103(a) over Itsudo et al. (JP05-198512), hereinafter "Itsudo," in view of Sivaramakrishnam et al. (U.S. 5,531,183 A), hereinafter "Sivaramakrishnam."

B. Whether claim 40 is unpatentable under 35 U.S.C. 103(a) over Itsudo et al. (JP05-198512) and Sivaramakrishnam et al. (U.S. 5,531,183 A) in view of Nguyen (U.S. 6,444,039 B1), hereinafter "Nguyen."

VII. ARGUMENT

For the purposes of this appeal, the claims do not stand or fall together.

Rather, the claims are argued as separate groups, as follows:

Group 1: Whether it is obvious to modify Itsudo to include the process gas supply line of Sivaramakrishnam (claims 29, 42, and 47)

Group 2: Claims limited to the structural limitations of the process gas identity (claims 29, 40, 42, and 47)

Claim Rejections – 35 U.S.C. § 103(a)

Group 1: Claims 29, 42, and 47

Claims 29, 42, and 47 stand rejected under 35 U.S.C. § 103(a) as being unpatentable over *Itsudo* in view of *Sivaramakrishnam*. Specifically, the Examiner states on page 9 of the Final Office Action mailed May 14, 2007 that “It would have been obvious to one of ordinary skill in the art at the time the invention was made to add Sivaramakrishnam’s gas supplies and for Itsudo to optimize the relative location of his processing gas supply line opening.”

Claim 29 is exemplary of the limitation for the location of the “**processing gas supply line**” connection included in claims 29, 42, and 47. Claim 29 recites:

A wafer processing apparatus, comprising:

- a processing chamber defined by a lower wall, an upper wall and side walls extending from the lower wall to the upper wall, a wafer supply opening being formed in one of the walls for transferring a wafer into the chamber;

- a susceptor in the processing chamber on which the wafer can be located so that an upper surface of the wafer faces the upper wall;

- a manifold component located on the processing chamber and, together with the upper surface of the upper wall, defining a manifold cavity;

- an exhaust line connected to the processing chamber, for flowing an exhaust gas from the processing chamber, connected such that the exhaust gas has a tendency to flow toward the exhaust line; and

- a **processing gas supply line connected to the manifold component** for providing a processing gas into the manifold cavity, wherein the processing gas comprises reactive gases used for processing the wafer, **the processing gas supply line connected via a processing gas supply line opening formed through an upper surface of the manifold cavity**, wherein the upper wall of the processing chamber comprises a plurality of processing gas supply openings, each of the processing gas supply openings provide an intake opening into an upper surface of the upper wall and an exhaust

opening out of a lower surface of the upper wall, to provide a pathway for flowing processing gas from the manifold cavity into the intake openings and out of the exhaust openings of the processing gas openings in the upper wall, and into the processing chamber, the processing gas supply openings being non-uniformly distributed over the upper wall to create a flow pattern comprising a predominantly vertical flow of processing gas onto the wafer.

“The legal concept of *prima facie* obviousness is a procedural tool of examination which applies broadly to all arts.” M.P.E.P. § 2142. The ultimate determination of patentability is based on the entire record, by a **preponderance of evidence**, with due consideration to the persuasiveness of any arguments and any secondary evidence. *In re Oetiker*, 977 F.2d 1443, 24 USPQ2d 1443 (Fed. Cir. 1992). The legal standard of “a preponderance of evidence” requires the evidence to be more convincing that the evidence which is offered in opposition to it.” Manual of Patent Examining Procedure (M.P.E.P.) § 2142.

Appellant respectfully submits that the Examiner has not shown that claims 29, 42, and 47 are obvious by a preponderance of the evidence. Appellant respectfully submits that claims 29, 42, and 47 are patentable over the cited references because (A) *Itsudo* **teaches away** from such a combination, (B) there is **no teaching, suggestion, or motivation to combine** the references, (C) such a rearrangement of *Itsudo* would **modify the operation** of the device of *Itsudo*.

A. The *Itsudo* and *Sivaramakrishnam* references cannot be combined because *Itsudo* teaches away from their combination

It is improper to combine references where the references teach away from their combination.” M.P.E.P. § 2145(X)(D)(1), citing *In re Grasselli*, 713 F2d 731, 743, 218 USPQ 769, 779 (Fed. Cir. 1983).

Itsudo discloses a low temperature photon assisted CVD apparatus which forms a thin film on a substrate. As shown in FIG. 6 of *Itsudo*, the photon assisted CVD apparatus includes a light source room 9 including an **inert (or purge) gas opening** 12, and a light source 11. The photon assisted CVD apparatus of *Itsudo* also includes a separate reaction chamber including the substrate 2 to be processed and a **reactant gas opening** 3. The light source room 9 and reaction chamber are divided by a perforated glass plate 8.

As discussed in detail in paragraph [0002] of *Itsudo*, the photon assisted CVD system is designed to have the reaction chamber and light source room 9 divided by the perforated glass plate 8 **in order to prevent reactant gases from soiling (depositing) on the light-transmission aperture and light source lamp 11 front face** located in the light source room 9. The reason for this particular configuration is explicitly stated as being because “**there was a big problem in [that] the quantity of light fell.**” Thus, the purging of the inert gas through the perforated plate of *Itsudo* is specifically used to prevent soiling of the light-transmission aperture and light source lamp 11 that would otherwise result from being in contact with reactant gases. Therefore, the inert (or purge) gas opening 12 is deliberately placed in the light source room 9 to preserve the quality of light produced and efficiency of the apparatus.

Accordingly, as discussed in paragraph [0013], the equipment of Itsudo constitutes **silane as a reactant gas**, and **uses argon gas as an inert gas**. As discussed in paragraph [0005], during the principal mode of operation of Itsudo, reactant gas is introduced directly into the reaction chamber 1 through reactant gas opening 3. The reactant gas is excited by the light emitted from the light source 11 and decomposes to form a thin film on substrate 2. At this time, the inert gas is introduced from the inert gas opening 12 directly into the light source room 9. The inert gas then flows through the perforated glass plate 8, and finally into the reaction chamber 1. Using this configuration a layer of adhesion (soiling) on the light source 11 is prevented.

The Examiner suggests that it would be obvious to modify the device of Itsudo, to connect the reactive gas supply line of Sivaramakrishnam to the inert gas supply opening of Itsudo. However, the photon assisted CVD system of Itsudo is specifically designed to prevent reactant gases from migrating outside of the reaction chamber because of the “big problem in [that] the quantity of light fell.” As is clearly evident in the above discussion, Itsudo **expressly teaches away** from the combination being proposed by the Examiner by describing having reactant gases outside the reaction chamber as a “big problem.”

On page 16 of the Final Office Action mailed May 14, 2007 the Examiner states “In response to applicant’s arguments against the references individually, one cannot show nonobviousness by attacking references individually where the rejections are based on combinations of references.” M.P.E.P. § 2145(IV). However, Appellant respectfully points out that “A [single] prior art reference that “teaches away” from the claimed invention is a significant factor to be considered

in determining obviousness; however, “the nature of the teaching is highly relevant and must be weighted in substance.” M.P.E.P. § 2145(X)(D)(1), citing “*In re Gurly*, 27 F.3d 551, 554, 31 USPQ2d 1130, 1132 (Fed. Cir. 1994).

Accordingly, Appellant respectfully submits that where *Itsudo* “teaches away” from the proposed combination by describing the effects of it as a “big problem” that according to M.P.E.P. § 2145(X)(D)(1) **the relevancy of this teaching be weighed in substance for how it discourages the claimed invention**. The teachings of *Itsudo* and *Sivaramakrishnam* are directed toward decidedly different devices with different principal modes of operation. While *Sivaramakrishnam* is entirely void of the effects of reactive process gases inside a manifold cavity, the teachings of *Itsudo* strongly discourage such a configuration. Therefore, Appellant respectfully submits that “teaching away” from the claimed invention in *Itsudo* outweighs in substance *Sivaramakrishnam*’s silence.

Accordingly, Appellant respectfully submits that because *Itsudo* teaches away from the proposed combination, the proposed combination is not *prima facie* obvious.

B. Claim 29, 42, and 47 are patentable over *Itsudo* in view of *Sivaramakrishnam* under 35 U.S.C. § 103(a) because there is no teaching, suggestion, or motivation to modify *Itsudo* to include the gas supply line of *Sivaramakrishnam*.

Obviousness can only be established by combining or modifying the teachings of the prior art to produce the claimed invention where there is some

teaching, suggestion, or motivation to do so. M.P.E.P. § 2143.01(I), citing *In re Kahn*, 441 F.3d 977, 986, 78 USPQ2d 1329, 1335 (Fed. Cir. 2006). The teaching, suggestion, or motivation must be found either explicitly or implicitly in the references themselves or in the knowledge generally available to one of ordinary skill in the art. M.P.E.P § 2143.01(I).

In support of the rejection the Examiner stated on page 14 of the Final Office Action mailed May 14, 2007 in part:

In this case, the Examiner has demonstrated that the prior art demonstrates teaching, suggestion, and motivation, found either in the references themselves, and in the knowledge generally available to one of ordinary skill in the art. In particular, motivation to add Sivaramakrishnam's gas supplies and for Itsudo **to optimize the relative location of his processing gas supply line opening** is to use process gas sources as precursors for operations and **to optimize desired process gas flows** as taught by Itsudo (abstract).

Appellant respectfully submits that the Examiner has **not proven by a preponderance of the evidence** that one of ordinary skill in the art would be motivated by either the references themselves or knowledge generally available **to modify the device of Itsudo to place the reactive processing gas supply line of Sivaramakrishnam into the inert gas supply opening of Itsudo.**

Appellant respectfully submits that contrary to the Examiner's argument, that there is **no teaching, suggestion, or motivation to combine** the references because (1) the proposed modification of Itsudo would **change the principal mode of operation** of Itsudo, (2) the proposed modification of Itsudo would render Itsudo **unsatisfactory for its intended purposes**, and (3) even

assuming the references can be combined or modified, that alone is insufficient to establish *prima facie* obviousness.

1. The proposed modification of *Itsudo* would change the principal mode of operation of *Itsudo*.

“If the proposed modification or combination of the prior art **would change the principal mode of operation of the prior art invention being modified**, then the teachings of the references are **not sufficient to render the claims *prima facie* obvious.**” M.P.E.P § 2143.01(VI), citing *In re Ratti*, 270 F2d 810, 123 USPQ 349 (CCPA 1959). The Examiner stated on page 13 of the Final Office Action mailed May 14, 2007 that “in resolving the level of ordinary skill in the art, the Examiner believes it would ... to add Sivaramakrishnam’s gas supplies and for *Itsudo* to optimize the relative location of his processing gas supply line opening.” Thus, **the issue is whether the Examiner’s proposed modification of *Itsudo* would change the principal mode of operation of *Itsudo*.**

As discussed in detail above in Section A, the photon assisted CVD system of *Itsudo* is designed to have the reaction chamber and light source room 9 divided by the perforated glass plate 8 **in order to prevent reactant gases from soiling (depositing) on the light-transmission aperture and light source lamp 11 front face** located in the light source room 9. The reason for this particular configuration is explicitly stated as being because “**there was a big problem in [that] the quantity of light fell.**” During the principal mode of

operation of Itsudo, reactant gas is introduced directly into the reaction chamber 1 through reactant gas opening 3. The reactant gas is excited by the light emitted from the light source 11 and decomposes to form a thin film on substrate 2. At this time, the inert gas is introduced from the inert gas opening 12 directly into the light source room 9. The inert gas then flows through the perforated glass plate 8, and finally into the reaction chamber 1. Using this configuration a layer of adhesion (soiling) on the light source 11 is prevented.

The Examiner suggests that it would be obvious to modify the device of Itsudo, to connect the reactive gas supply line of Sivaramakrishnam to the inert gas supply opening of Itsudo. However, contrary to the Examiner's assertion, such a modification would **change the principal mode of operation of Itsudo, because there would be no purging of inert gas through the perforated plate 8 in order to prevent the "big problem" of depositing a soiled layer on the light source 11 and the associated reduced quality of light emitted from the source 11**. Appellant respectfully submits that the suggested combination of references and modification of Itsudo would therefore require a substantial reconstruction and redesign of the apparatus of Itsudo to avoid the detrimental effects of the reduced quality of emitted light, as well as **change the basic principal under which the construction of the photon assisted CVD system of Itsudo was designed to operate**. Accordingly, Appellant respectfully submits that because the proposed modification of Itsudo would change the principal mode of operation, that there is no teaching, suggestion, or motivation to combine the references.

2. The proposed modification of *Itsudo* would render *Itsudo* unsatisfactory for its intended purpose.

“If the proposed modification would render the prior art invention being modified **unsatisfactory for its intended purpose**, then there is no suggestion or motivation to make the proposed modification.” M.P.E.P § 2143.01(V), citing *In re Gordon*, 733 F.2d 900, 221 USPQ 1125 (Fed. Cir. 1984). As discussed above in Section (B)(1), the Examiner suggests that it would be obvious to modify the device of *Itsudo*, to connect the reactive processing gas supply line of *Sivaramakrishnam* to the inert gas supply opening of *Itsudo*. Thus, **the issue is whether the Examiner’s proposed modification of *Itsudo* would render *Itsudo* unsatisfactory for its intended purpose.**

Appellant respectfully submits that contrary to the Examiner’s assertion, such a modification would **render *Itsudo* unsatisfactory for its intended purpose**, because the “big problem” would still exist of depositing a soiled layer on the light source 11 along with the associated reduced quality of light emitted from the source 11. As a result, the intended purpose of providing a photon assisted CVD system that ***avoids the issue of depositing a soiled layer*** on the light source 11 would be compromised by the suggested modification, and in fact the modification would result in an unsatisfactory device.

By way of comparison, see *In re Gordon*, 733 F.2d 900, 221 USPQ 1125 (Fed. Cir. 1984), which involved a claimed a blood filter assembly device and a prior art reference that taught a liquid strainer. At issue was whether it would have been obvious to turn the liquid strainer upside down in order to meet the claims of the claimed blood filter assembly. The final holding was that if the

liquid strainer was turned upside down it would be **inoperable for its intended purpose** because the **screen would become clogged**, and therefore there was no showing of *prima facie* obviousness.

Application of the holding from *In re Gordon* is appropriate in the instant case. Similar to the suggestion of turning the prior art liquid strainer device upside down, the Examiner at hand is suggesting to insert a reactive processing gas supply line into an opening designed for an inert gas supply line. Like the prior art device of *In Re Gordon*, in which turning the device upside down would clog the screen, inserting a reactive processing gas supply line into an opening designed for an inert gas supply line would result in **depositing a soiled layer** on the light source 11 along with the associated reduced quality of light emitted from the source 11. As a result, the deposited soiled layer and reduced quality of light emission would then render the device of *Itsudo* **unsatisfactory for its intended purpose**. Accordingly, Appellant respectfully submits that because the proposed modification of *Itsudo* would render the device unsatisfactory for its intended use, that there is no teaching, suggestion, or motivation to combine the references.

3. Even assuming the references can be combined or modified, that alone is not sufficient to establish prima facie obviousness.

M.P.E.P § 2143.01(III) reads in the entirety as follows:

The mere fact that references can be combined or modified does not render the resultant combination obvious unless the prior art also suggests the desirability of the combination. *In re Mills*, 916 F2d 680, 16 USPQ2d 1430 (Fed. Cir. 1990) (Claims were directed to an apparatus for producing an aerated cementitious composition by

drawing air into the cementitious composition by driving the output pump at a capacity greater than the feed rate. The prior art reference taught that the feed means can be run at a variable speed, however the court found that this does not require that the output pump be run at the claimed speed so that air is drawn into the mixing chamber and is entrained in the ingredients during operation. **Although a prior art device “may be capable of being modified to run the way the apparatus is claimed, there must be a suggestion or motivation in the reference to do so.”** 916 F.2d at 682 16 USPQ2d at 1432. See also *In re Fritch*, 972 F.2d 1260 23 USPQ2d 1780 (Fed. Cir. 1992) (flexible landscape edging device which is conformable to a ground surface of varying slope is not suggested by combination of prior art references).

Consistent with the reading of M.P.E.P § 2143.01(III), Appellant respectfully submits that even if the apparatus of *Itsudo* is “capable of” being modified to run the way the Examiner suggests, there is no suggestion or motivation to do so in the references themselves, nor in the knowledge generally available to one of ordinary skill in the art. The teaching or suggestion to make the claimed combination and the reasonable expectation of success must both be found in the prior art, not in Appellant’s disclosure. *In re Vaech*, 947 F.2d 488, 20 USPQ2d 1438 (Fed. Cir. 1991).

It is Appellant’s understanding that the Examiner purports that modifying *Itsudo* to add *Sivaramakrishnam’s* reactive processing gas supply line to the inert gas opening 12 of *Itsudo* is taught, suggested, or motivated by

(i) a teaching, suggestion, or motivation found in the knowledge generally available to one of ordinary skill in the art “to **optimize the relative location of [Itsudo’s]** processing gas supply line opening,” (see page 13 of the Final Office Action mailed may 14, 207)

(ii) a teaching, suggestion, or motivation found in the knowledge generally available to one of ordinary skill in the art “to use **process gas sources as**

precursors for operations,” (see page 14 of the Final Office Action mailed may 14, 207) and

(iii) a teaching, suggestion, or motivation found in Itsudo “to **optimize desired process gas flows.**” (see page 14 of the Final Office Action mailed may 14, 207)

However, Appellant respectfully submits that all three assertions are overly broad in the instant application.

First, as discussed above in Section A and Sections B(1) and B(2), and discussed further in Section (C) the purported modification does not “**optimize** the relative location of the processing gas supply opening.” Itsudo expressly teaches away from such a configuration, and in fact such a modification of Itsudo would have **detrimental effects** to the operation of the device rather than optimize operation of the device.

Second, it is unclear what the Examiner is suggesting by stating “to use process gases as precursors for operations.” This is precisely what reactive processing gases are used for: precursors for operations. It is well known in the art that reactive processing gases are utilized as a source of elements to decompose and/or react to form layers, whereas inert gases are utilized due to their non-reactive properties. Itsudo already utilizes reactive processing gases as precursors for operations, and intentionally introduces the reactive processing gases directly into the reaction chamber while purging an inert gas through the perforated glass plate to prevent the reactive processing gases from forming a soiled layer on the light source 11.

Lastly, the Examiner applies the motivation found in Itsudo “to optimize desired process gas flows” too broadly. Appellant agrees with the Examiner in that Itsudo aims “to optimize the desired process gas flows,” however, it is also clear that the optimization of processing gas flows in Itsudo is restricted to a photon assisted CVD system in which reactive processing gases cannot come into contact with the light source. Thus, while it may be physically possible to modify the apparatus of Itsudo to include a reactive processing gas supply line in the inert gas supply opening, Itsudo does not teach that doing so would “optimize the desired process gas flows” because Itsudo teaches that the desired reactive gas flows directly into the reaction chamber.

Accordingly, Appellant respectfully submits that because there is no suggestion or motivation for the proposed combination of references taught in the references themselves, nor in the knowledge generally available to one of ordinary skill in the art, that that the resultant combination is not *prima facie* obvious.

C. Mere rearrangement of parts is not considered obvious to those of ordinary skill in the art when such a rearrangement would **modify the operation** of the device.

On page 14 of the Final Office Action mailed May 14, 2007 the Examiner seeks to provide motivation to add Sivaramakrishnam's reactive processing gas supply line to the device of Istudo by stating “it is well established that the **rearrangement of parts is considered obvious** to those of ordinary skill.” However, Appellant respectfully submits that a rearrangement of parts is **not**

considered obvious when doing so would **modify the operation of the device** or the rearrangement of parts is **merely a design choice**. M.P.E.P. § 2144.04(VI)(C). See, for example, *In re Japiske*, 181 F.2d 1019, 86 USPQ 70 (CCPA 1950) (claims to a hydraulic power press which read on the prior art except with regard to the **position of the starting switch** were held unpatentable because the shifting the position of the starting switch **would not have modified the operation of the device**), and *In re Kuhle*, 526 F.2d 553, 188 USPQ 7 (CCPA 1975) (the particular **placement of a contact** in a conductivity measuring device was held to be an obvious matter of **design choice**).

Contrary to the matters in *Japiske* and *Kuhle*, in the instant case the Examiner is suggesting to modify *Itsudo* to add *Sivaramakrishnam's* reactive processing gas supply line to the inert gas opening of *Itsudo*. Such a modification would substantially modify the operation of the device of *Itsudo*, and is more than a matter of mere design choice. As discussed above in Section (B)(1) the modification would **change the principal mode of operation** of *Itsudo*, and as discussed above in Section (B)(2) the proposed modification of *Itsudo* would render *Itsudo* **unsatisfactory for its intended purpose**.

Accordingly, Appellant respectfully submits that because rearrangement of reactive gas supply line of *Itsudo* would modify the operation of the device and is not merely a design choice, that the proposed rearrangement of parts would not be considered obvious to those of ordinary skill in the art.

Group 2: Claims 29, 40, 42, and 47

Claims 29, 42, and 47 stand rejected under 35 U.S.C. § 103(a) as being unpatentable over Itsudo in view of Sivaramakrishnam. Claim 40 stands rejected under 35 U.S.C. § 103(a) as being unpatentable over Itsudo and Sivaramakrishnam in view of Nguyen. Appellant claims in claims 29, 40, 42, and 47 a processing gas that comprises “**reactive gases**.” Appellant additionally claims in claims 40 and 42 that the “processing gas in the manifold cavity comprises **non-depleted reactive gases**.” The Examiner stated on page 11 of the Final Office Action mailed May 14, 2007 that “gas identity is not considered a structural limitation in the pending apparatus claims.”

Appellant respectfully submits that the claims are patentable over the cited references because (A) the combination does not teach the structural limitations of the gas identity, and (B) such a combination would render Itsudo unsuitable for its **intended use**.

A. Gas identity is considered a structural limitation, and the prior art fails to teach the elements of gas identity claimed by Appellant

The Examiner stated on page 11 of the Final Office Action mailed May 14, 2007 that “gas identity is not considered a structural limitation in the pending apparatus claims. Further it has been held that claim language that simply specifies an intended use or field of use for the invention generally will not limit the scope of a claim (Walter , 618 F.2d at 769, 205 USPQ at 409; MPEP 2106).”

M.P.E.P § 2114 discusses patentability for apparatus claims including functional language. “While features of an apparatus may be recited either

structurally or functionally, claims directed to an apparatus must be distinguished from the prior art in terms of structure rather than function. *In re Schreiber*, 128 F.3d 1473, 1477-78, 44 USPQ2d 1429, 1431-32 (Fed. Cir. 1997).” Further, **“Apparatus claims cover what a device *is*, not what a device *does*.”** *Hewlett-Packard Co. v. Bausch & Lomb Inc.*, 8909 F.2d 1464, 1469, 15 USPQ2d 1525, 1528 (Fed. Cir. 1990) (emphasis in original).

However, contrary to the Examiner’s assertion, Appellant respectfully submits that gas identity is considered a structural limitation in the pending apparatus claims. For example claim 29 requires “the processing gas comprises reactive gases used for processing the wafer.” In the recited limitation the portion “the processing gas comprises reactive gases” is indeed a structural limitation, while the phrase “used for processing the wafer” could be interpreted as a functional description of the reactive gases. To be more specific, a gas is considered reactive if it contains a structural group that is understood in the art as being reactive. One of ordinary skill in the art would understand that reactive gases decompose and/or react to form a layer on the wafer in the processes chamber, whereas non-reactive gases do not contain such a functional group.

Additionally, the limitation of claims 40 and 42 that the “processing gas in the manifold cavity comprises **non-depleted reactive gases**” is also a structural limitation. In these claims the depleted and non-depleted process gas compositions are structurally distinguishable from each other based on composition.

Accordingly, Appellant respectfully submits that gas identity is considered a structural limitation in the pending apparatus claims, and that claims 29, 40,

42, and 47 are patentable over the cited references because the combination does not teach all of the structural limitations of the claims.

B. Substituting reactive processing gases for inert gases is unsuitable for the intended use of the device of *Itsudo*.

The Examiner stated on page 11 of the Final Office Action mailed May 14, 2007 that "If the prior art structure is capable of performing the indented use, then it meets the claim (In re Casey, 152 USPQ 235 (CCPA 1967); In re Otto , 136 USPQ 458, 459 (CCPA 1963); MPEP2111.02."

Appellant respectfully points out that M.P.E.P. § 2111.02 is directed toward statements reciting purpose or intended use in the *preamble* of a claim. Appellant's claim preambles are limited to "A wafer processing apparatus, comprising." The structural limitation of the processing gas composition comprising reactive gases or non-depleted reactive gases is found in the body of the claim.

M.P.E.P. § 2144.07 requires that the substitution of a known material based its on suitability for **its intended use** be satisfied in order to support a *prima facie* obviousness determination. However, the intended use at issue is that of *Itsudo*, and not of the structure claimed by Appellant. The issue is if it is obvious to modify *Itsudo* by changing the inert gas that feeds into the light source room 9 (manifold cavity) in *Itsudo* with the reactive processing gases of *Sivaramakrishnam*. Therefore, **the criteria for obviousness is measured by the intended use of the inert gas being injected into the light source room 9 of *Itsudo*.**

Itsudo uses inert gas to specifically keep out and exclude reactive processing gases from the light source room 9, which is the intended use that the substitution material must satisfy to establish obviousness. Therefore, substituting reactive processing gases for inert gases is unsuitable for the intended use of excluding reactive processing gases from the light source room 9. Accordingly, the § 103(a) rejection is improper and fails to clearly define the intended use of the material to be replaced.

On page 15 of the Final Office Action mailed May 14, 2007 the Examiner argues that "Applicant's arguments hinge on what process chemicals/materials are considered **reactive** and what chemicals/materials are considered *inert*" and further states that "Itsudo's apparatus is not limited to the disclosed processing which fix what materials **react** and what materials are *inert*." The Examiner goes on to posit that "only one gas need to be inert in Itsudo's manifold (9; Figure 6) and reactive in Itsudo's processing chamber (1; Figure 6) to meet the intended use." However, such an assertion is contrary to what is claimed by Appellant. Appellant claims "a processing gas supply line connected to the manifold component for providing a processing gas into the manifold cavity, **wherein the processing gas comprises reactive gases** used for processing the wafer." It is clear from the claim language that the processing gases are **reactive** gases irrespective of whether the processing gases **react** in the manifold cavity. If Appellant had intended otherwise, then Appellant would have claimed that the processing gas comprises inert gases.

Accordingly, Appellant respectfully submits that because substituting reactive processing gases for inert gases would render Itsudo unsuitable its

intended use, that the proposed substitution would not be considered obvious to those of ordinary skill in the art.

VIII. CONCLUSION

For the reasons stated above, claims 29, 42, and 47 are patentable under 35 U.S.C. 103(a) over Itsudo in view of Sivaramakrishnam, and claim 40 is patentable under 35 U.S.C. 103(a) over Itsudo and Sivaramakrishnam in view of Nguyen.

Appellant respectfully requests that the Board reverse the rejections of the claims 29, 40, 42, and 47 under U.S.C. § 103(a) and direct the Examiner to enter a Notice of Allowance for claims 29, 40, 42, and 47.

Fee For Filing A Brief In Support Of Appeal

Enclosed is a check in the amount of \$500.00 to cover the fee for filing a brief in support of an appeal as required under 37 C.F.R. 1.17(c) and 40.20(b)(2). (If a check is not enclosed, you are hereby authorized to charge the deposit account below).

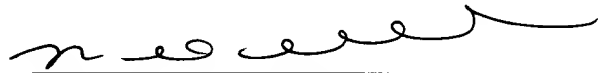
Deposit Account Authorization

Authorization is hereby given to charge our Deposit Account No. 02-2666 for any charges that may be due. Furthermore, if an extension is required, then Appellant hereby requests such extension.

Respectfully submitted,

BLAKELY, SOKOLOFF, TAYLOR & ZAFMAN LLP

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APPENDIX A : CLAIMS

Listing of Claims:

1-28 (Canceled)

29. (Previously Presented) A wafer processing apparatus, comprising:

a processing chamber defined by a lower wall, an upper wall and side walls extending from the lower wall to the upper wall, a wafer supply opening being formed in one of the walls for transferring a wafer into the chamber;

a susceptor in the processing chamber on which the wafer can be located so that an upper surface of the wafer faces the upper wall;

a manifold component located on the processing chamber and, together with the upper surface of the upper wall, defining a manifold cavity;

an exhaust line connected to the processing chamber, for flowing an exhaust gas from the processing chamber, connected such that the exhaust gas has a tendency to flow toward the exhaust line; and

a processing gas supply line connected to the manifold component for providing a processing gas into the manifold cavity, wherein the processing gas comprises reactive gases used for processing the wafer, the processing gas supply line connected via a processing gas supply line opening formed through an upper surface of the manifold cavity, wherein the upper wall of the processing chamber comprises a plurality of processing gas supply openings, each of the processing gas supply openings provide an intake opening into an upper surface of the upper wall and an exhaust opening out of a lower surface of the upper

wall, to provide a pathway for flowing processing gas from the manifold cavity into the intake openings and out of the exhaust openings of the processing gas openings in the upper wall, and into the processing chamber, the processing gas supply openings being non-uniformly distributed over the upper wall to create a flow pattern comprising a predominantly vertical flow of processing gas onto the wafer.

40. (Previously Presented) The apparatus of claim 29 wherein the processing gas in the manifold cavity comprises non-depleted reactive gases used for processing the wafer.

42. (Previously Presented) A wafer processing apparatus, comprising:

- a processing chamber defined by a lower wall, an upper wall and side walls extending from the lower wall to the upper wall;
- a susceptor in the processing chamber on which the wafer can be located so that an upper surface of the wafer faces the upper wall;
- a manifold component located on the processing chamber and, together with the upper surface of the upper wall, defining a manifold cavity;
- an exhaust system comprising an exhaust line connected to the processing chamber, for flowing an exhaust gas from the processing chamber;
- a processing gas supply line connected to the manifold component;
- a plurality of processing gas supply openings distributed non-uniformly in the upper wall providing a means for supplying a processing gas from the manifold cavity to the processing chamber, wherein the processing gas

comprises non-depleted reactive gases used for processing the wafer, wherein the exhaust gas comprises reacted gases and depleted processing gas, wherein the processing gas supply openings are non-uniformly distributed over the upper wall, wherein the processing gas supply openings, the manifold cavity and component, processing gas supply, and exhaust system predominantly determine the flow pattern of processing gas onto the upper surface of the wafer.

47. (Previously Presented) A wafer processing apparatus, comprising:

- a processing chamber defined by a lower wall, an upper wall and side walls extending from the lower wall to the upper wall;

- a susceptor in the processing chamber on which the wafer can be located so that an upper surface of the wafer faces the upper wall;

- a manifold component located on the processing chamber and, together with the upper surface of the upper wall, defining a manifold cavity;

- a processing gas supply line connected to the manifold component;

- a plurality of processing gas supply openings in the upper wall, wherein a processing gas from the manifold cavity passes into the processing chamber, wherein the processing gas comprises reactive gases used for processing the wafer, wherein the processing gas supply openings are non-uniformly distributed over the upper wall; and

- an exhaust system comprising an exhaust line connected to the processing chamber, for flowing an exhaust gas from the processing chamber, wherein the exhaust gas comprises reacted gases and depleted processing gas.

APPENDIX B: EVIDENCE

NONE

APPENDIX C: RELATED PROCEEDINGS

NONE